



SEQUENCE LISTING

<110> KUMAGAI, Monto H.  
DELLA-CIOPPA, Guy R.  
ERWIN, Robert L.  
McGEE, David R.

<120> METHOD OF DETERMINING THE PRESENCE OF A  
TRAIT IN A PLANT BY TRANSFECTING A NUCLEIC ACID SEQUENCE OF  
A NON-PLANT DONOR INTO A HOST PLANT IN A POSITIVE  
ORIENTATION

<130> 008010137US07

<140> 09/359,300  
<141> 1999-07-21

<160> 60

<170> FastSEQ for Windows Version 3.0

<210> 1  
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<212> DNA  
<213> Tomato mosaic virus

<400> 1

ctcgcaaagt ttcgaaccaa atcctc

26

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<400> 2

cggggtagct gggcccaac cgggggttcc ggggg

35

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<213> Tomato mosaic virus

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tcctcgagcc taggctcgca aagtttcgaa ccaaattcctc a

41

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cggggtagct gggcccaac cgggggttcc ggggg

35

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<213> Tomato mosaic virus

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tatgtatggt gcagaagaac agat

24

<210> 6

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<213> Tomato mosaic virus

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agtcgactctt tttttttttt gcat

24

<210> 7

<211> 30

<212> DNA

<213> Tomato mosaic virus

<400> 7

tgctcgagtg tttttttttt ttttttttgc

30

<210> 8

<211> 30

<212> DNA

<213> Tomato mosaic virus

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aactcgagcg ctttatttttcc tccgaagctt

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<210> 9

<211> 114

<212> DNA

<213> Tomato mosaic virus

<220>

<221> CES

<222> (28) ... (115)

<400> 9

gttttaataa cgttcgaggt tttaaat atg tct gtt gcc ttg tta tgg gtt gtt  
Met Ser Val Ala Leu Leu Trp Val Val

1

5

54

tct cct tgc gtc tca aat ggg aca agt ttc atg gaa tca gtc cgg  
Ser Pro Cys Asp Val Ser Asn Gly Thr Ser Phe Met Glu Ser Val Arg  
10 15 20 25

102

gag gga aac cgt  
Glu Gly Asn Arg

114

<210> 10

<211> 29

<212> PPT

<213> Tomato mosaic virus

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1 5 10 15  
Gly Thr Ser Phe Met Glu Ser Val Arg Glu Gly Asn Arg  
20 25

<210> 11  
<211> 39  
<212> DNA  
<213> Nicotiana benthamiana

<400> 11  
gcctcgagtg cagcatggaa acccttctaa agctttcc 39

<210> 12  
<211> 36  
<212> DNA  
<213> Nicotiana benthamiana

<400> 12  
tcccttaggtc aaaggctctc tattgctaga ttgcc 36

<210> 13  
<211> 111  
<212> DNA  
<213> Tobacco mosaic virus

<220>  
<221> CDS  
<222> (25)...(111)

<400> 13  
gttttaata cgctcgagtg cagc atg gaa acc ctt cta aag cct ttt cca 51  
Met Glu Thr Leu Leu Lys Pro Phe Pro  
1 5

tct cct tta ctt tcc att cct act cct aac atg tat agt ttc aaa cac 99  
Ser Pro Leu Leu Ser Ile Pro Thr Pro Asn Met Tyr Ser Phe Lys His  
10 15 20 25

aac ttc act ttt  
Asn Phe Thr Phe 111

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<211> 29  
<212> PPT  
<213> Tobacco mosaic virus

<400> 14  
Met Glu Thr Leu Leu Lys Pro Phe Pro Ser Pro Leu Leu Ser Ile Pro  
1 5 10 15  
Thr Pro Asn Met Tyr Ser Phe Lys His Asn Phe Thr Phe  
20 25

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ccaaagcttct cagtcgcgc atgcagcaac cgccgcgtgct tgac		44
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aagatctctc gagstaaacg ggacgctgcc aaagaccggc cgc		43
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<213> Tobacco mild green mosaic virus		
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tgtgaaaactt gaaaaaggttc cgg		23
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cggggtaacct gggccgcctac cggcggttag gggagg		36
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<211> 31		
<212> DNA		
<213> Ribgrass mosaic virus		
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tactcgaggt tcataagacc gcggtagggcg g		31
<210> 20		
<211> 36		
<212> DNA		
<213> F. grass mosaic virus		
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cggggtaacct gggccgcctac cgggggtttt gggagg		36
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<213> N. tabacum		
<400>		
<211> CDS		
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Met Ala Ser Ser Val Leu Ser Ser Ala Ala Val	
1 5 10	
gcc acc cgc agc aat gtt gct caa gct aac atg gtt gca cct ttc act	101
Ala Thr Arg Ser Asn Val Ala Gln Ala Asn Met Val Ala Pro Phe Thr	
15 20 25	
ggc ctt	107
Gly Leu	

<210> 22  
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 <212> PRT  
 <213> N. tabacum

<400> 22	
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1 5 10 15	
Val Ala Gln Ala Asn Met Val Ala Pro Phe Thr Gly Leu	
20 25	

<210> 23  
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 <213> Tobacco mild green mosaic virus

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acggccctaa agtttagtgc ttccctgtctt ttacgaaaaa ggaggaaattt ttacccaaagg	180
ttttgacgag attaaagact gtctcttatta gtactaagga tttttatattt gtttaaggagt	240
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ttgggtgtttt ggggtgtttt ttacccgggtt aatggctggt accggattttt gttaaagggtt	360
gggttaacagt gagggtgtt gacaaaacggc ttggaaaattt cagagagtgc ataattggta	420
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ttttttttttt ggtttttttttt ggtttttttttt ggtttttttttt ggtttttttttt ggtttttttttt	600
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<210> 24		
<211> 55		
<212> DNA		
<213> rape mosaic virus		
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gatggccgcct taatacgact cactatagtt ttattttgt tgcaacaaca acaac		55
<210> 25		
<211> 30		
<212> DNA		
<213> rape mosaic virus		
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cttgtgcctt tcatgacgag cttatcact		30
<210> 25		
<211> 497		
<212> DNA		
<213> rape mosaic virus		
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caacaaaaca aatacaaaca acaacaacat ggcacaattt caacaaaacag taaacatgca	120	
aaacattgcag gctgcgcgcag ggcgcacacag cctggtaat gatttagct cacgacgtgt	180	
ttatgacaat gctgtcgagg agctaaatgc acgctcgaga cggccctaagg ttcattactc	240	
caaatacgatg tctacggaac atgacgctgt tagttcaaa cgtttatccg gagtttgaga	300	
tttcccttac tcataacccaa catgcgtac actcccttgc gggtggccta aggactcttg	360	
agtttagagta tctcatgtatg caagttccgt tgggtctct gacgtacgac atcgggtgta	420	
actttgcagg gcacccccc aaggacgcg actacgttca ctgctgtatg ccaaacttgg	480	
atgtacgtga tataat	497	
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<212> DNA		
<213> rape mosaic virus		
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<213> rape mosaic virus		
<400> 28		
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<210> 29		
<211> 497		
<212> DNA		
<213> rape mosaic virus		
<400> 29		
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aaacattgcag gctgcgcgcag ggcgcacacag cctggtaat gatttagct cacgacgtgt	180	

ttatgacaat	gtgtcgagg	agctaaatgc	acgctcgaga	cgcctaagg	ttcattactc	240
caaatacggt	tatcgaaac	agacgctgtt	agcttcaaacc	gcttatccgg	agtttgagat	300
ttcccttact	atacccaaa	catggcgatc	actcccttgc	gggtggccca	aggactcttg	360
agtttagatg	tatcgatg	caagttccgt	tcgggtcttt	gacgtacgac	atcggtggta	420
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atgtacgtga	tatagtct					497
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gatggggcct	taatacgact	cactatagtt	ttatccgtt	tgcaacaaca	acaac	55
<210>	31					
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caagtttgc	caaacgaacg	tctcac				26
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tccttaggtt	agaatcttgc	aagaccggtc	ttctcg			36
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:212> DNA  
<213> Arabidopsis thaliana

:400> 36

tcgagcggcc gcat

14

<210> 37

<211> 42

<212> DNA

<213> Trichosanthes kirilowii

<400> 37

gcctcgagtg cagcatgatc agattcttag tcctctcttt gc

42

<210> 38

<211> 36

<212> DNA

<213> Trichosanthes kirilowii

<400> 38

tcccttaggtt aaatagcata acttccacat caaagc

36

<210> 39

<211> 109

<212> DNA

<213> Trichosanthes kirilowii

<221>

<222> CDS

<223> (10)...(109)

<400> 39

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Met Ile Arg Phe Leu Val Leu Ser Leu Leu Ile  
1 5 10

52

ctc acc ctc ttc cta aca act cct gct gtg gag ggc gat gtt agc ttc  
Leu Thr Leu Phe Leu Thr Thr Pro Ala Val Glu Gly Asp Val Ser Phe  
15 20 25

100

sgt tta tca

Arg Leu Ser

30

109

<210> 40

<211> 30

<212> PRT

<213> Trichosanthes kirilowii

<400> 40

Met Ile Arg Phe Leu Val Leu Ser Leu Leu Ile Leu Thr Leu Phe Leu  
1 5 10 15  
Thr Thr Pro Ala Val Glu Gly Asp Val Ser Phe Arg Leu Ser  
20 25 30

<210> 41

<211> 19

<212> PRT

<213> *P. ycelii*

<400> 41

Ser Tyr Val Pro Ser Ala Glu Gln Ile Leu Glu Phe Val Lys Gln Ile  
1 5 10 15

Ser Ser Gln

<210> 42

<211> 839

<212> DNA

<213> *Nicotiana benthamiana*

<220>

<221> CDS

<222> (15) ... (677)

<400> 42

cttcacatcc ggcg atg gct cta cct aac cag caa aca gtc gat tac cct 50  
Met Ala Leu Pro Asn Gln Gln Thr Val Asp Tyr Pro  
1 5 10

agc ttc aag ctc gtt atc gtt ggc gat gga ggc aca ggg aag acc aca 98  
Ser Phe Lys Leu Val Ile Val Gly Asp Gly Gly Thr Lys Thr Thr  
15 20 25

ttt gta aag aga cat ctt act gga gag ttt gag aag aag tat gaa ccc 146  
Phe Val Lys Arg His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro  
30 35 40

act at: ggt gtt gag gtt cat cct ctt gat ttc ttc act aac tgt ggc 194  
Thr Ile Gly Val Glu Val His Pro Leu Asp Phe Phe Thr Asn Cys Gly  
45 50 55 60

aag atc cgt ttc tac tgt tgg gat act gct ggc caa gag aaa ttt ggt 242  
Lys Ile Arg Phe Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly  
65 70 75

ggt ctt agg gat ggt tac tac atc cat gga caa tgt gct atc atc atg 290  
Gly Leu Arg Asp Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met  
80 85 90

ttt gat gtc aca gca cga ctc aca tac aag aat gtt cca aca tgg cca 338  
Phe Asp Val Thr Ala Arg Leu Thr Tyr Lys Asn Val Pro Thr Trp His  
95 100 105

cgt gat ctt tgc agg gtt tgt gaa aac atc cca att gtt ctt tgt ggg 386  
Arg Asp Leu Cys Arg Val Cys Glu Asn Ile Pro Ile Val Leu Cys Gly  
110 115 120

aat aaa gtt gat gtg aag aac agg caa gtc aag gcc aag cag gta aca 434  
Asn Lys Val Asp Val Lys Asn Arg Gln Val Lys Ala Lys Gln Val Thr  
125 130 135 140

ttc cac agg aag aac ctc cag tat tac gag ata tct gcc aag aca 482

Phe His Arg Lys Lys Asn Leu Gln Tyr Tyr Glu Ile Ser Ala Lys Ser  
 145 150 155

aac tac aac ttc gag aag cca ttc ttg tac ctt got aga aag ctc gcc  
 Asn Tyr Asn Phe Glu Lys Pro Phe Leu Tyr Leu Ala Arg Lys Leu Ala  
 160 165 170

ggg gag gct aat ctt cac ttt gtg gaa tca cct gcc ctt gct ccc ccc  
 Gly Asp Ala Asn Leu His Phe Val Glu Ser Pro Ala Leu Ala Pro Pro  
 175 180 185

gaa gtt caa atc gac ttg gct gct cag cag cag cat gag ggg gag ctt  
 Glu Val Gln Ile Asp Leu Ala Ala Gln Gln His Glu Ala Glu Leu  
 190 195 200

gca gca gca gca agt cag cca ctt cct gat gac gat gat gac acc ttc  
 Ala Ala Ala Ala Ser Gln Pro Leu Pro Asp Asp Asp Asp Asp Thr Phe  
 205 210 215 220

gag tagagaaaaga gagatgtat ctgtcaactga ttaccggta gggcttgtct  
 Glu

gaactttttt ttgttcatgg tggatttttt atgtgtcgtg acctttgaaat gaatcgatga  
 cattagtaat ttcatttttt aagttttaa ctgtcgatgaaat gaaagtgaaa ac

<210> 43  
 <211> 221  
 <212> PPT  
 <213> Nicotiana benthamiana

<400> 43

Met Ala Leu Pro Asn Gln Gln Thr Val Asp Tyr Pro Ser Phe Lys Leu  
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Val Ile Val Gly Asp Gly Gly Thr Gly Lys Thr Thr Phe Val Lys Arg  
 20 25 30

His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro Thr Ile Gly Val  
 35 40 45

Glu Val His Pro Leu Asp Phe Phe Thr Asn Cys Gly Lys Ile Arg Phe  
 50 55 60

Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly Gly Leu Arg Asp  
 65 70 75 80

Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met Phe Asp Val Thr  
 85 90 95

Ala Arg Leu Thr Tyr Lys Asn Val Pro Thr Trp His Arg Asp Leu Cys  
 100 105 110

Arg Val Cys Glu Asn Ile Pro Ile Val Leu Cys Gly Asn Lys Val Asp  
 115 120 125

Val Lys Asn Arg Gln Val Lys Ala Lys Gln Val Thr Phe His Arg Lys  
 130 135 140

Lys Asn Leu Gln Tyr Tyr Glu Ile Ser Ala Lys Ser Asn Tyr Asn Phe  
 145 150 155 160

Glu Lys Pro Phe Leu Tyr Leu Ala Arg Lys Leu Ala Gly Asp Ala Asn  
 165 170 175

Leu His Phe Val Glu Ser Pro Ala Leu Ala Pro Pro Glu Val Gln Ile  
 180 185 190

Asp Leu Ala Ala Gln Gln His Glu Ala Glu Leu Ala Ala Ala

195	200	205
Ser Gln Pro Leu Pro Asp Asp Asp Asp Asp	Asp Thr Phe Glu	
210	215	220

«210» 44  
 «211» 738  
 «212» DNA  
 «213» Nicotiana benthamiana

«400» 44

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gagagtttga	gaagaagtat	gaacccacta	ttgggtgtga	ggttcatct	cttgattttt	180
tcaactaactg	tggcaagatc	cgtttctact	gttggatact	gttggccaa	agaaatttgg	240
tggtttttag	gttggtaact	acatccatgg	acaatgtgt	atcatcatgt	ttgatgttac	300
agcacgactg	acatacaaga	atgttccaa	atggcaccgt	gttggatgt	gggttttgg	360
aaaacatccc	aattgttctt	tgtggaaata	aagttgtat	gaagaacagg	caagtcaagg	420
ccaaaggagg	aacattccac	aggaagaaga	accccaacta	ttacgagata	tctggccaa	480
gcaactacaa	tttgcgagaag	ccattttgt	accttgcgt	aaagctcgcc	ggggacgcta	540
atcttcaat	tgtggaaatca	cttgccttgc	ctcccccgg	atgttcaata	gacttgggt	600
ctcagcagca	gcatgaggcg	gagttgcag	cagcagcaag	tcagccattt	cctgatgacg	660
atgtgacac	tttgcgtat	agaaagagag	atgtgatctg	tcactgat	cccggttaggg	720
tttgtctgaa	ttttttttt					738

«210» 45  
 «211» 679  
 «212» DNA  
 «213» Arabidopsis thaliana

«400» 45

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gagagtttga	gaagaagtat	gaacccacta	ttgggtgtga	ggttcatct	cttgattttt	180
tcaactaactg	tggcaagatc	cgtttctact	gttggataac	tgtggccaa	gagaaatttgg	240
tgggttttag	gttggttat	acatccatg	acaatgtgt	tatcatcatg	tttgcgtat	300
caggacgact	gacatacagg	aatgttccaa	catggcaccgt	tgattttgc	agggttttgg	360
ccaaaggagg	aacattccac	aggaaggagg	accccaacta	ttacgagata	tctggccaa	420
gcaactacaa	tttgcgagaag	ccattttgt	accttgcgt	aaagctcgcc	ggggacgcta	480
atcttcaat	tgtggaaatca	cttgccttgc	ctcccccgg	atgttcaata	gacttgggt	540
ctcagcagca	gcatgaggcg	gagttgcag	cagcagcaag	tcagccattt	cctgatgacg	600
atgtgacac	tttgcgtat	agaaagagag	atgtgatctg	tcactgat	cccggttaggg	660
tttgtctgaa	ttttttttt					679

«210» 46  
 «211» 667  
 «212» DNA  
 «213» N. tabacum

«400» 46

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gatggaggca	caggaaagac	cacatttgt	aagagacatc	ttaatggaga	gtttgagaag	120
aaatgttgc	ccactattgg	tgttggatgt	catccctttt	atccatctac	taatgttggc	180
aaatgttgc	tatctgtt	ggataactgt	ggccaaagaga	aatttttgtt	ttttagggat	240
ggttactaca	tccatggaca	atgtgtatc	atcatgtttt	atgttccatgt	acgacttgcac	300
tacaagaatg	ttccaaatgt	gttccatgt	ttttgttgg	tttgcgtat	ccatccattt	360
gttccatgt	ggaataaaatgt	tgttgcgtat	ttttgttgg	tttgcgtat	ccatccattt	420
ttccatgt	agaagaacatc	ccatccattt	gagatatctg	ccatccattt	ccatccattt	480

gagaaggccat	tcttgtaacct	tgcttagaaag	ctcgccgggg	acgctaatact	tcaactttgtg	540
gaatccatcg	cccttgcctc	cccgaaagt	caaatacgact	tggatgctca	gcagcagcat	600
gaggcggagc	ttgcagcagc	agcaagtcag	ccacttccgt	atgacgatga	tgacaccc	660
gagtaga						667

<210> 47  
 <211> 667  
 <212> DNA  
 <213> N. tabacum

<400> 47						
atggctctac	caaaccacaa	aactgttagat	tatccaaagct	tcaagcttgt	aatcgtgggc	60
gatggaggaa	ctggggaaaac	aacttttgc	aagaggccatc	ttactgggtg	atttgagaag	120
aaataatgaa	ccactattgg	tgtggaggt	catccattag	attttttcac	aaattgtggg	180
aaaatttgt	tttattgtg	ggataatgt	ggacaagaga	atgtttggagg	tcttcggat	240
ggttactaca	ttcatgggc	atgcgcatt	atcatgtttg	atgtttacags	ccgtctgacc	300
tacaagaatg	ttcttacgt	gcatcgagat	ctctgcaggg	tttgtgaaaa	catcccccatt	360
gttctttgt	gaaaacaaagt	tgtgtcaag	aacaggcagg	ttaaggcaaa	gcaagttacc	420
ttccacagga	agaaaaattt	gcaataactat	gagatctcag	caaagagtaa	ctacaacttt	480
gagaagectt	ttctgtaccc	tgcagaaaa	cttgcgtggg	atgcataatct	tcactttgtg	540
gaatcacctg	caattgtcc	ccctgaagta	caaattgatt	tagtgcaca	gcaactgcat	600
gaacaagagc	ttttgcaagg	cgctgogcac	gcacttccag	atgacgatga	tgaagcttt	660
gaataga						667

<210> 48  
 <211> 137  
 <212> PFT  
 <213> Tobacco mosaic virus

<400> 48						
Met Ala Leu Pro Asn Gln Gln Thr Val Asp Tyr Pro Ser Phe Lys Leu						
1	5	10	15			
Val Ile Val Gly Asp Gly Gly Thr Gly Lys Thr Thr Phe Val Lys Arg						
20	25	30				
His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro Thr Ile Gly Val						
35	40	45				
Glu Val His Pro Leu Asp Phe Phe Thr Asn Cys Gly Lys Ile Arg Phe						
50	55	60				
Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly Gly Leu Arg Asp						
65	70	75	80			
Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met Phe Asp Val Thr						
85	90	95				
Ala Arg Leu Thr Tyr Lys Asn Val Pro Thr Trp His Arg Asp Leu Cys						
100	105	110				
Arg Val Cys Glu Asn Ile Pro Ile Val Leu Cys Gly Asn Lys Val Asp						
115	120	125				
Val Lys Asn Arg Gln Val Lys Ala Lys						
130	135					

<210> 49  
 <211> 135  
 <212> PFT  
 <213> Tobacco Mosaic Virus

<400> 49						
Met Ala Leu Pro Asn Gln Gln Thr Val Asp Tyr Pro Ser Phe Lys Leu						
1	5	10	15			

Val Ile Val Gly Asp Gly Gly Thr Gly Lys Thr Thr Phe Val Lys Arg  
 20 25 30  
 His Leu Thr Gly Glu Phe Glu Lys Lys Tyr Glu Pro Thr Ile Gly Val  
 35 40 45  
 Glu Val His Pro Leu Asp Phe Phe Thr Asn Cys Gly Lys Ile Arg Phe  
 50 55 60  
 Tyr Cys Trp Asp Thr Ala Gly Gln Glu Lys Phe Gly Gly Leu Arg Asp  
 65 70 75 80  
 Gly Tyr Tyr Ile His Gly Gln Cys Ala Ile Ile Met Phe Asp Val Thr  
 85 90 95  
 Ser Thr Thr Asp Ile Gln Glu Cys Ser Asn Met Ala Pro Ser Leu Gln  
 100 105 110  
 Gly Leu Lys His Ser Gln Leu Phe Phe Val Gly Ile Lys Leu Met Lys  
 115 120 125  
 Asn Arg Gln Val Lys Ala Gln  
 130 135

<210> 50  
 <211> 277  
 <212> DNA  
 <213> Tobacco mosaic virus

<220>  
 <221> CDS  
 <222> (1)....(277)

<400> 50  
 gct act atg gtt gcc tct ccg gct cag gcc act atg gtc gct cct ttc 48  
 Ala Thr Met Val Ala Ser Pro Ala Gln Ala Thr Met Val Ala Pro Phe  
 1 5 10 15  
 aac gga ctt aag tcc tcc gct cct tcc cag cca ccc gca agg cta aca 96  
 Asn Gly Leu Lys Ser Ser Ala Pro Ser Gln Pro Pro Ala Arg Leu Thr  
 20 25 30  
 acg aca tta ctt cca tca caa gca acg gcg gaa gag tta act gca tgc 144  
 Thr Thr Leu Leu Pro Ser Gln Ala Thr Ala Glu Glu Leu Thr Ala Cys  
 35 40 45  
 agg tgg ggc ctc cga ttg gaa aga aga agt ttg aga ctc tct ctt acc 192  
 Arg Cys Gly Leu Arg Leu Glu Arg Arg Ser Leu Arg Leu Ser Leu Thr  
 50 55 60  
 ttc ctt acc tta ccg att ccg aat tgg cta agg aag ttg act acc tta 240  
 Phe Leu Thr Leu Pro Ile Pro Asn Trp Leu Arg Lys Leu Thr Thr Leu  
 65 70 75 80  
 tcc gca aca agt gga ttc ctt gtg ttg aat tcg aag t 277  
 Ser Ala Thr Ser Gly Phe Leu Val Leu Asn Ser Lys  
 85 90

<210> 51  
 <211> 90  
 <212> PRT  
 <213> Tobacco mosaic virus

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<400 51
Ala Thr Met Val Ala Ser Pro Ala Gln Ala Thr Met Val Ala Pro Phe
 1           5           10          15
Asn Gly Leu Lys Ser Ser Ala Pro Ser Gln Pro Pro Ala Arg Leu Thr
 20          25          30
Thr Thr Leu Leu Pro Ser Gln Ala Thr Ala Glu Glu Leu Thr Ala Cys
 35          40          45
Arg Cys Gly Leu Arg Leu Glu Arg Arg Ser Leu Arg Leu Ser Leu Thr
 50          55          60
Phe Leu Thr Leu Pro Ile Pro Asn Trp Leu Arg Lys Leu Thr Thr Leu
 65          70          75          80
Ser Ala Thr Ser Gly Phe Leu Val Leu Asn Ser Lys
 85          90

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<210> 51
<211> 167
<212> DNA
<213> Arabidopsis thaliana
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<400> 52  
acttgatgtg tttcatacta aaacccaaaac tcatgtttgt tcactccaaa cacaaacaca 60  
gcagtaatca aaaatgtct tataacaaaa ggaaatgcaa caaaacagaa gaaacaacta 120  
aqtatgttaqqc aqgattctt ttcactcqtc ttcttqqcta cqqaqc 167

<210> 53  
<211> 393  
<212> DNA  
<213> *Arabidopsis thaliana*

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<400> 53
gaaacgacgt cggttagtta ttgggcattgg cctgaccaggc agcaacaaca tcacaatcat 60
catcgttca attgatcata ttgtctttaaga acaacatcat actcatcttg atatcattat 120
ttatcatcaa aacaaaattt cgttagatttt tttataatagt attttcaaata tattttggcac 180
gtttaaaattt aatttttttttgg ggttattatgt tttacttgat ctgttttata ctaaaaaccaa 240
aaggaaaaacc aaaactcatg tttgttcaact ccaaacaccaa acacagcagt aatcaaaaat 300
cgtagttataa caaaaaggaa atgcaacaaa acagaagaaa caactaagta gttagggaaaga 360
ttttttttca ctgtttttct tggctacqqa ggc 393

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<211> 54  
<211> 24  
<211> PPT  
<213> Arabidopsis thaliana
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400: 54  
 Glu Thr Thr Ser Ala Ser Tyr Trp Ala Trp Pro Asp Gln Gln Gln Gln  
 1 5 10 15  
 His His Asn His His Gln Phe Asn  
 24

4210: 55  
4211: 418  
4212: DNA  
4213: *Homo sapiens*

...400: 55  
ggaaacgggtc ggcggcatcag tggatggaaatgtc cggggaaaggggc aaagtttggc tcggatccaa 60  
ttggaaatccgc gacatcttcgtca tggccaaatcc cccggccaaacatcggaaatgc ttgttgcggaa 120

tggtttccatc atcaggaagc caaccaagat tcactcttgt tccagagctc gcaaaatgaa	180
gattggccaaag atgaagggtc gtcactctgg atacggtaag aggaagggtt cccgtgaagc	240
taggttggccaa acaaaggtac tgtggatgcg taggatgcgt gtttttaggc gtctttgaa	300
gaaatacaga gagacgaaga agattgacaa gcacatgtac catgacatgt acatgcgtgt	360
taagggttaat gtgttcaaga acaagggtgt cttgatggag agtataccaa agtcaaaggc	420
ttagaagctt ggggagaa	438

<210> 56  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

<400> 56	
gaagagggtc gcttttagtg tcttcgggtt tggcaagaag aaggttgtgt tagaccccaa	60
ttagaccaat gaaatgcgcg atgcggaaatc ccgtcagcag atccggaaagc tcatcaaaga	120
tgggttgtatc atccggcaaggc ctgtgacgggtt ccattccgg gtcgtatgcg gggaaaaacac	180
cttggccggc cggaaagggtt ggcacatggg cataggttaag cggaaagggtt cagccatgc	240
ccgaatgcgcg gagaaggtca catggatgag gagaatgagg attttgcgcg ggttgttcag	300
aagataccgtt gaatctaaga agatcgatcg ccacatgtat cacagctgtt acctgaagggt	360
gaagggttggat gtgttcaaaa acaagggtgt tctcatggaa cacatccaca agtctaaggc	420
agacaaaggcc cggaaagaa	438

<210> 57  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

<400> 57	
gaagggtgtc ggccatcag tttatgttttgcg cggggaggc aaagttttggc tccatcccaa	60
cgaaaaggccg gacatcttccg tggccaaattc ccgcggaaac atccggaaagc ttgttgcgg	120
tggtttccatc atccggaaaggc caaccaagat tcactcttgt tccagagctc gcaaaatgaa	180
gattggccaaatg atgaagggtc gtcactctgg atacggtaag aggaagggtt cccgtgaagc	240
taggttggccaa acaaaggtac tgtggatgcg taggatgcgt gtttttaggc gtctttgaa	300
gaaatacaga gagacgaaga agattgacaa gcacatgtac catgacatgt acatgcgtgt	360
taagggttaat gtgttcaaga acaagggtgt cttgatggag agtataccaa agtcaaaggc	420
ttagaagctt ggggagaa	438

<210> 58  
 <211> 438  
 <212> DNA  
 <213> Homo sapiens

<400> 58	
gaagagggtc gcttttagtg tcttcgggtt tggcaagaag aaggttgtgt tagaccccaa	60
ttagaccaat gaaatgcgcg atgcggaaatc ccgtcagcag atccggaaagc tcatcaaaga	120
tgggttgtatc atccggcaaggc ctgtgacgggtt ccattccgg gtcgtatgcg gggaaaaacac	180
cttggccggc cggaaagggtt ggcacatggg cataggttaag cggaaagggtt cagccatgc	240
ccgaatgcgcg gagaaggtca catggatgag gagaatgagg attttgcgcg ggttgttcag	300
aagataccgtt gaatctaaga agatcgatcg ccacatgtat cacagctgtt acctgaagggt	360
gaagggttggat gtgttcaaaa acaagggtgt tctcatggaa cacatccaca agtctaaggc	420
agacaaaggcc cggaaagaa	438

<210> 59  
 <211> 145  
 <212> PRT  
 <213> Tobacco mosaic virus

<400> 59

Lys Arg Leu Ala Ala Ser Val Met Lys Cys Gly Lys Gly Lys Val Trp  
1 5 10 15  
Leu Asp Pro Asn Glu Ser Ser Asp Ile Ser Met Ala Asn Ser Arg Gln  
20 25 30  
Asn Ile Arg Lys Leu Val Lys Asp Gly Phe Ile Ile Arg Lys Pro Thr  
35 40 45  
Lys Ile His Ser Arg Ser Arg Ala Arg Lys Met Lys Ile Ala Lys Met  
50 55 60  
Lys Gly Arg His Ser Gly Tyr Gly Lys Arg Lys Gly Thr Arg Glu Ala  
65 70 75 80  
Arg Leu Pro Thr Lys Val Leu Trp Met Arg Arg Met Arg Val Leu Arg  
85 90 95  
Arg Leu Leu Lys Lys Tyr Arg Glu Thr Lys Lys Ile Asp Lys His Met  
100 105 110  
Tyr His Asp Met Tyr Met Arg Val Lys Gly Asn Val Phe Lys Asn Lys  
115 120 125  
Arg Val Leu Met Glu Ser Ile His Lys Ser Lys Ala Lys Leu Gly Glu  
130 135 140  
Lys  
145

<210> 60

<211> 147

<212> PRT

<213> Homo sapiens

<400> 60

Lys Arg Leu Ala Ser Ser Val Leu Arg Cys Gly Lys Lys Lys Val Trp  
1 5 10 15  
Leu Asp Pro Asn Glu Thr Asn Glu Ile Ala Ala Asn Ala Asn Ser Arg  
20 25 30  
Gln Gln Ile Arg Lys Leu Ile Lys Asp Gly Leu Ile Ile Arg Lys Pro  
35 40 45  
Val Thr Val His Ser Arg Ala Arg Cys Arg Lys Asn Thr Leu Ala Arg  
50 55 60  
Arg Lys Gly Arg His Met Gly Ile Gly Lys Arg Lys Gly Thr Ala Asn  
65 70 75 80  
Ala Arg Met Pro Glu Lys Val Thr Trp Met Arg Arg Met Arg Ile Leu  
85 90 95  
Arg Arg Leu Leu Arg Arg Tyr Arg Glu Ser Lys Lys Ile Asp Arg His  
100 105 110  
Met Tyr His Ser Leu Tyr Leu Lys Val Lys Gly Asn Val Phe Lys Asn  
115 120 125  
Lys Arg Ile Leu Met Glu His Ile His Lys Leu Lys Ala Asp Lys Ala  
130 135 140  
Arg Lys Lys  
145